revista Eptic
v. 26, n. 2, mai.-ago., 2024
ISSN: 1518-2487

When home office is a privilege of servitude: towards a morphology of digital labor at the new artificial intelligence industry

Quando o *home office* é privilégio da servitude: por uma morfologia do trabalho digital na nova indústria da inteligência artificial

Cuando el home office es un privilegio de la servidumbre: hacia una morfología del trabajo digital en la nueva industria de la inteligencia artificial

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Submetido em: 24 mar. 2024

Aprovado em: 01 set. 2024

Abstract

Work mediated by microtask platforms has been studied worldwide, but still lacks a consensual definition. Based on a literature review, we present in this paper a typology in order to differentiate such form of digital labor from others, considering the dynamic of discontinuity and continuity that marks the history of innovation in capitalism. This has challenged social scientists to establish, from different areas and theoretical perspectives, categories to describe and analyse recent metamorphosis in work. Finally, we draw attention to the fact that artificial intelligence not only eliminates but also creates degraded forms of living labor.

Keywords: Digital labor; Capitalism; Artificial intelligence; Microtask platforms; Precarization.

Resumo

Estudado no mundo todo, o trabalho mediado por plataformas de micro tarefas carece de uma definição consensual. Com base em uma revisão da literatura, apresentamos, neste artigo, uma tipologia por meio da qual é possível contrastar esta nova forma de trabalho digital com outras, sem desprezar a dinâmica de descontinuidade e continuidade que marca a própria história da inovação no capitalismo. Isto tem desafiado cientistas sociais a estabelecer, a partir de diferentes disciplinas e perspectivas teóricas, categorias a fim de descrever e analisar as metamorfoses mais recentes do trabalho. Por fim, chamamos a atenção para o fato de que, a inteligência artificial não apenas elimina como também cria formas degradadas de trabalho vivo.

Palavras-chave: Trabalho digital; Capitalismo; Inteligência artificial; Plataformas de micro tarefas; Precarização.

Resumen

Estudiado en todo el mundo, el trabajo mediado por plataformas de microtareas carece de una definición consensuada. A partir de una revisión de la literatura, en este artículo presentamos una tipología a través de la cual es posible contrastar esta nueva forma de trabajo digital con otras, sin descuidar las dinámicas de discontinuidad y continuidad que marcan la historia misma de la innovación en el capitalismo. Esto ha desafiado a los científicos sociales a establecer, desde diferentes disciplinas y perspectivas teóricas, categorías para describir y analizar las metamorfosis más recientes del trabajo. Finalmente, llamamos la atención sobre el hecho de que la inteligencia artificial no sólo elimina sino que también crea formas degradadas de trabajo vivo.

Palabras clave: Trabajo digital; Capitalismo; Inteligencia artificial; Plataformas de microtareas; Precariedad.

1. Introduction

As a promise to free humanity from the drudgeries of the factory and the office, artificial intelligence (AI) involves research and development (R&D) on electronic digital computer systems capable of automating tasks related to visual perception, language recognition, translation and even decision-making. The spread of AI applications has raised questions in recent years about the end of journalism (Latar, 2015) or code (Tanz, 2016); soon joining earlier warnings about the end of the working class (Gorz, 1981) or the end of work itself (RifkinN, 1995).

The same litany is repeated after rollouts in R&D and computing. This was no different when Buzzfeed announced the adoption of ChatGPT (Bruell, 2023), right after laying off 180 workers from the newsroom (Mullin and Robertson, 2023). AI yet eliminates another form of labor: the journalist! Tasks usually carried out by humans, such as writing sports and financial news or social media content, can now be automated by generative large language models like Open AI's ChatGPT. In fact, "this could result in job cuts and job insecurity in the sector" (Komi et al., 2022 apud Alcântara, 2023, p. 83).

AI does eliminate part of the journalist's work, but it does not mean the end of this kind of job, much less the end of all jobs in the future. As discussed in the present paper, AI has not only eliminated old forms of labor, but also created new forms of living labor to meet the industry demands. It is on us today to research what these forms might be, thus avoiding futuristic exercises that stumble into the traps of technological determinism. According to historian David Noble (2011, p. xii), determinism provides simple answers to difficult social questions, reinforcing the *status quo* and generalizing the belief that humans are incapable of deciding on the social uses of science and technology. In his words, "*if this ideology simplifies life, it also diminishes life, fostering compulsion and fatalism, on the one hand, and an extravagant, futuristic, faith in false promises, on the other*" (Noble, 2011, p. xiii).

2. Another farewell to work?

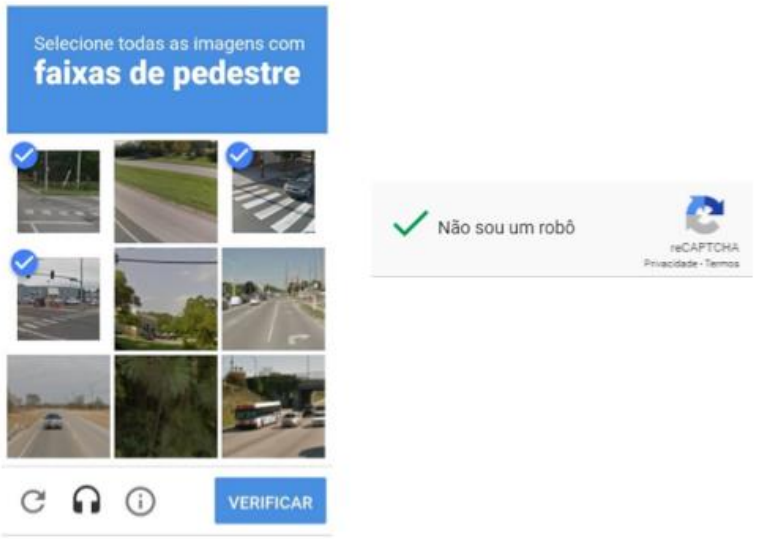
The thesis about the end of work or its social centrality (Mchlup, 1962; Touraine, 1969; Bell, 1973; Rifkin, 1995; Gorz, 1981; Offe, 1985; Castells, 2007) has been challenged once again, resurrected by the recent connectionist or neo-connectionist turn in AI and other fields of computer science (Andler, 1992; Olazaran, 1996; Pasquinelli, 2017; Cardon, Cointet and Mazières, 2018, Hao, 2019). Prospective studies emphasizing a possible rise in unemployment caused by AI (Brynjolfsson and Mcafee, 2014; Chui et al, 2016; Frey and Osborne, 2017) is being superseded by researches in social sciences showing how dependent this technology still is of living labor. AI depends not only on the well-paid and skilled work of those who develop its models, but also on the low-paid and de-skilled work of those who label vast datasets. Living labor is crucial to tune a wide variety of statistical algorithms, including multi-layer artificial neural networks or deep learning (Aytes, 2013; Ekbia and Nardi, 2014; Irani, 2013, 2015; Hitlin, 2016; Schmidt, 2017; Berg et al., 2018; Gray and Suri, 2019; Roberts, 2019; Crawford and Joler, 2019; Casilli, Tubaro, Le Ludec et al., 2019).

Despite efforts to automate data labeling (Kniazieva, 2022), machine learning algorithms are not as intelligent or smart as the "fourth industrial revolution" prophets announced in Davos almost a decade ago (Schwab, 2016). From the times of Bayt al-Hikmah, these intangible servomechanisms are defined as a discrete set of logical-arithmetic rules and procedures (Mosconi, 1989; Chabert et al., 1994; Andler, 1998; Finn, 2017), but still demand a lot of training to "learn"! And we, humans, are their masters... After all, who has never labeled

vehicles, bridges, trees, crosswalks, traffic lights, stairs, numbers and letters on a reCAPTCHA[1] checkbox to access a website?

Via application programming interfaces (APIs), the service is offered free of charge by Google Cloud for companies to combat spam and "abusive" bots, while improving object detection, image classification and text digitization on a large scale. ReCAPTCHA impels thousands of Internet-Web users to carry out unpaid tasks, in the form of intellectual or cognitive tests lasting up to ten seconds. It requires more *esprit de finesse* than *esprit de géométrie*, in reference to the Pascalian distinction so dear to the critics of symbolic AI computationalism - the paradigm of "good and old-fashioned artificial intelligence" (GOFAI) (Dreyfus, 1972, Wilden, 1972).

Figure 1 – reCAPTCHA Brazilian's version: dialog box for pedestrian crossing verification



Source: ReCAPTCHA, 2020.

The global market for text, image and audio dataset training services was created to meet the demands of the new AI industry, based nowadays on microtask or microwork platforms[2] that combine various APIs with the "lean business model" of the pioneering Mechanical Turk (MTurk), launched in 2005 by Amazon. Despite latent, this market is already worth around US$ 1 billion and expected to reach a compound annual growth rate of 22.5% by 2027 (Grand View Research, 2020).

This type of labor has been studied in Brazil recently (Kalil, 2019; Moreschi, Pereira, Cozman, 2020; Rosenfield, Mossi, 2020; Grohmann, Araújo, 2021a, 2021b; Viana Braz, 2021, 2022, 2023; Grohmann et al., 2022a, 2022b; Viana Braz, 2021; Viana Braz, Mendes, Ferreira, 2022; Viana Braz, Tubaro, Casilli, 2023). Such platforms started attracting workers looking for side hustles in a makeshift home office, many of whom had lost their jobs or suffered time reduction due to the COVID-19 pandemic. Not by chance, Our Hit Stop, a website that hosts a forum and sells a Chrome extension to find less poorly paid jobs on Amazon MTurk, has seen a rise

[1] The acronym stands for "completely automated public Turing test to tell computers and humans Apart". Unlike the Turing test, this one would be "completely" administered by computers, not by humans, hence the lowercase prefix "re", from reverse. The test was created in the late 1990's and came to light after the eponymous startup was bought by Google in 2009. The exact figure of the deal was not revealed back then, but its founder Luis von Ahn, Professor of Computer Sciences at Carnegie Mellon University, co-founder and Chief Executive Officer (CEO) of Duolingo, informed that the sale ranged from US$ 10 to 100 million (GRISWOLD, 2014).

[2] Hereinafter called microtasks platforms.

of 20% in newcomers and 30% in re-entrants, while Hive Micro (formerly Hive Work), a start-up launched in 2013 by Castle Global, has more than doubled its workforce, thanks to a new wave of cybertaskers from Brazil and the Philippines (Simonite, 2020).

3. "Newspeak" of digital labor

Companies from software and hardware industries are provoking social scientists to establish criteria of description and analysis, from different perspectives, on what is new and old in this increasingly precarious labor world (Huws, 2019; Abílio, 2020; Grohmann; Qiu, 2020). Digital platforms today can be seen as heterogeneous as the productive activities of the three major economic sectors listed from A to U by the International Standard Industrial Classification (ISIC) or the non-standard forms of employment recognized by the International Labour Organization (ILO).

In the media and academia, expressions such as "uberization" or "turkerization" (the latter less frequent than the former) try to account, in the absence of precise vocabulary, for the emergence of sociotechnical systems based on human-computer interaction[3] through which "employment relationships are increasingly individualized and socially invisibilized, thus taking on the appearance of 'service provision'" (Antunes, 2020:11) - as opposed to the classic employee-employer regulation (Kalil, 2019).

The sociotechnical systems, ironically more Taylorist than Tavistockian, result from medium and long-term trends. For over 300 years, at each accumulation cycle, capitalists have been driven to innovate their business models compulsorily, or rather, compulsively, melting "all that is solid into the air" at a dizzying pace, as Marx and Engels had noted in their modern and still current Manifesto of the Communist Party, published in the mid-19th century.

Technical and scientific knowledge ensures the renewal of productive force, competitive strategy which is central in capitalism's history of "creative destruction" (SCHUMPETER, 2014). Companies have been investing in R&D since the inception of capital, in order to cut costs, control workers, expand consumer markets, overcome geographical boundaries, speed up production time and the circulation of goods. Meanwhile, the promotion of shared projects for the future is often based on self-fulfilling prophecies and hype (Guice, 1998).

Most recent innovations promoted by these companies result from a long-term trend. Today, however, they aim to achieve competitive advantages in labor markets where the medium-term trend is to reduce headcount inside the companies and increase it outside, using digital means of production and increasingly precarious workforce, with easy turnover and no dismissal costs, especially when the economy goes from bad to worse (Harvey, 1992 :144).

Since the second half of the "long 20th century" (Arrighi, 1994), the rise of lean companies has been inspired by the flexibility of on-demand work processes, typical of Toyotism, but far beyond the automotive factory (Krafcik, 1988). Against Fordism and the rigidity of large-scale processes, productive forces have been renewed in combination with neoliberal policies. Labor

[3] The term sociotechnical system was coined, shortly after the Second World War, by British social scientists from the Tavistock Institute of Human Relations, inspired by general systems theory. The first studies of the sociotechnical school focused on problems related to coal mining automation in Durham, northern United Kingdom (BIAZZI JR, 1994). The Tavistock group, composed mostly of psychologists and sociologists, proposed to renew the principles of modern management. For the advocates of sociotechnical systems, work, instead of broken down into simple tasks as in Taylorism, should be conceived as a complex whole where humans and machines enter a complementary and optimised interaction (TRIST and BAMFORTH, 1951; WOODWARD, 1965). Flexible work practices relating to these principles are now widespread, such as basic work unit, work groups, self-regulation, variety of functions, autonomy and freedom of action, complementary parts, diversity, etc. (Trist, 1981).

rights are being dismantled all over the world, either by conservative or progressive governments, opposed to Keynesian policies that once marked the exceptional "Glorious Thirty" - solely in the geographical centers of capitalism (Harvey, 1992: 115-184).[4]

At the dawn of the 21st century, these new companies were stimulated by digital convergence and financial capital in different fields of science and technology. They rediscovered, in the rubbles of the Welfare State, old sociotechnical systems dating back to mercantilism during the 16th and 17th centuries in Western Europe – a period when the proto-industrial division of labor began to undermine the regulatory power of craft guilds, transforming skilled craftsmen into mere deskilled workers, paid by the piece ("putting out system") or task ("*le tâcheronnage*") (Marglin, 1978).

This trend in labor markets returned after the second oil shock in 1973. Since then, the burst of financial bubbles, such as the dot-com in 2001 and the rotten mortgage assets in 2007, intensified labor precarity, underway for the last 50 years and aggravated by the global financial crisis in 2008. A "4.0" update of the old "putting-out-system" in the software industry moved its production from the center to the periphery of capitalism.

Countless neologisms in English, often difficult to translate to other languages, are used today to describe recent changes in the world of work. Through the lenses of history, we realize how they mark not only discontinuities with the past, but also continuities... From "just-in-time" and "digital entrepreneurship" to "cloudsourcing" and even "platform cooperativism", investors, consultants and managers have successfully combined "digital" with "labor" in favor of capital, resorting to glossary present in both the discourse of cybernetics and the proletarian struggle in the middle of last century (Martins, 2005: 165, Antunes, 2009: 233).

If we were to present here an exhaustive list of the lexical flood in the "information society" history and the debate on the "future of work" (Mattelart, 2001; Fuchs And Sandoval, 2014), we would drown amid new expressions that have already or will soon become dated, given planned obsolescence. Unwitting adherence to this prolix Orwellian "Newspeak "of digital labor risks not only disconnecting the current discourse from previous studies, but can also, in some cases, impede intelligibility (Huws, 2019: 2). To the detriment of the working class, a fetishistic techno-scientific glossary disregarding history is on the tip of the tongues of many lobbyists for the new AI industry – based today on statistical algorithms with extensive use of data and transnational microtask platforms, always refractory to any regulation. In the midst of such flooding, has the term digital labor also become obsolete?

This expression follows Dallas Smythe (1977)'s thesis in Marxist tradition. Initially, it was used by Christian Fuchs (2012, 2014) and Nick Dyer-Witheford (2012), among others, to describe and analyze the unpaid work of the audience on social-digital platforms (SDP), such as Facebook (Meta) and YouTube (Google). However, it has lost precision when in reference to any form of labor mediated by digital platforms, becoming, according to Alessandro Gandini (2021), "empty of meaning". Hence his advocacy for the term "platform labor" instead of digital labor. This distinction, in his view, describes more accurately the qualitative change in the relation between the world of work and cybernetic communication and information technologies. In his words,

> While, from a purely descriptive perspective, instances of platform labour arguably entail the appropriation of certain unpaid user activity and personal user data for profit-making purposes, ultimately the key feature of platform labour does not lie in the exploitation of users' free labour but in the presence

[4] "*Les Trente Glorieuses*" was coined by French economist Jean Fourastié in late 1970s to retrospectively describe the expansion of capitalism between 1945 and 1973. The term became obsolete after numerous criticisms pointing to the limits of post-war economic growth, an exception in the history of capitalism (Piketty, 2014; Gordon, 2016; Noiriel, 2018).

> of a digital platform that imposes a capital-labour relationship upon users, facilitating – and regulating – the direct exchange of labour as a commodity. (Gandini, 2021, p. 6)

Recent studies have drawn the conceptual limits of Smythe's approach to grasp new forms of digital labor (Graham et al., 2017; Wood et al., 2019). After all, the debate here is not about commodification of the audience during users' leisure time, as initially proposed "*à la* Fuchs" (Gandini, 2021, p. 6).[5] Digital labor takes on new forms that deserve adequate description and analysis, including paid and underpaid labor, as mediated by microtask platforms.

4. Towards a morphology of digital labor in the new AI industry

While business model of sociodigital platforms is based on advertising, microtask platforms operate management, that is, control, of economic activities established between clients and "service providers". Similarly to other digital labor platforms (Cardon and Casilli, 2015; Casilli, 2019), microtask platforms offer to their clients training services for AI or machine learning databases, and offer to "service providers" a possibility of extra income or "online earnings" (Tubaro, Casilli, Coville, 2020, p. 2). This way, microtask platforms allow academic and industrial laboratories quick access to a global, flexible and cheap workforce, cutting research costs related to data processing, such as collection, classification, storage, retrieval and dissemination.

Microworkers and LionBridge, based in the United States, adopt business models as "lean" as the pioneer Amazon MTurk – already profuse in international academic studies, especially anglophone. There are a few microtask platforms providing services to a single client, like the Universal Human Relevance System (UHRS) serving Microsoft in a sort of "imperfect market competition" or "monopsony" (Robinson, 1933). Moreover, hybrid platforms, such as the German Clickworker, act as a marketplace, similar to Amazon MTurk, but also as a supplier to larger clients, including UHRS itself (Berg et al. 2018; Gary and Sury, 2019; Tubaro, Casilli, Coville, 2020).

They also differ in size and scope. Some are startups, others have grown to become transnationals, such as Appen, a publicly traded company based in Sydney that has bought major players, like Leapforce and FigureEight, formerly CrowdFlower (Tubaro, Casilli, Coville, 2020). Amazon MTurk covers a wide variety of demands from industrial and academic labs, while others are specialized in visual computing services for retail, like Hive Micro, or autonomous vehicles, like Spare5 from MightyAI – recently bought by Uber (Schmidt, 2019).

In contrast to digital labor executed on demand via apps, microtasks are a form of remote or online digital labor outsourced on a large scale – by and for a "crowd" (Cardon and Casilli, 2015; Stefano, 2015; Huws, 2016). Hence the neologisms "crowdwork" and "crowdsourcing", borrowed from the world of business administration and computing.

Based on the typology proposed by Florian Schmidt (2017), then updated in 2018 by Janine Berg et al. (2018), microtasks are described as digital remote labor, now called "cloudwork". The term "virtual", applied a decade ago in reports by the World Bank and other studies on remote work, seems to have become obsolete (Lehdonvirta and Ernkvist, 2011; Huws, 2014).

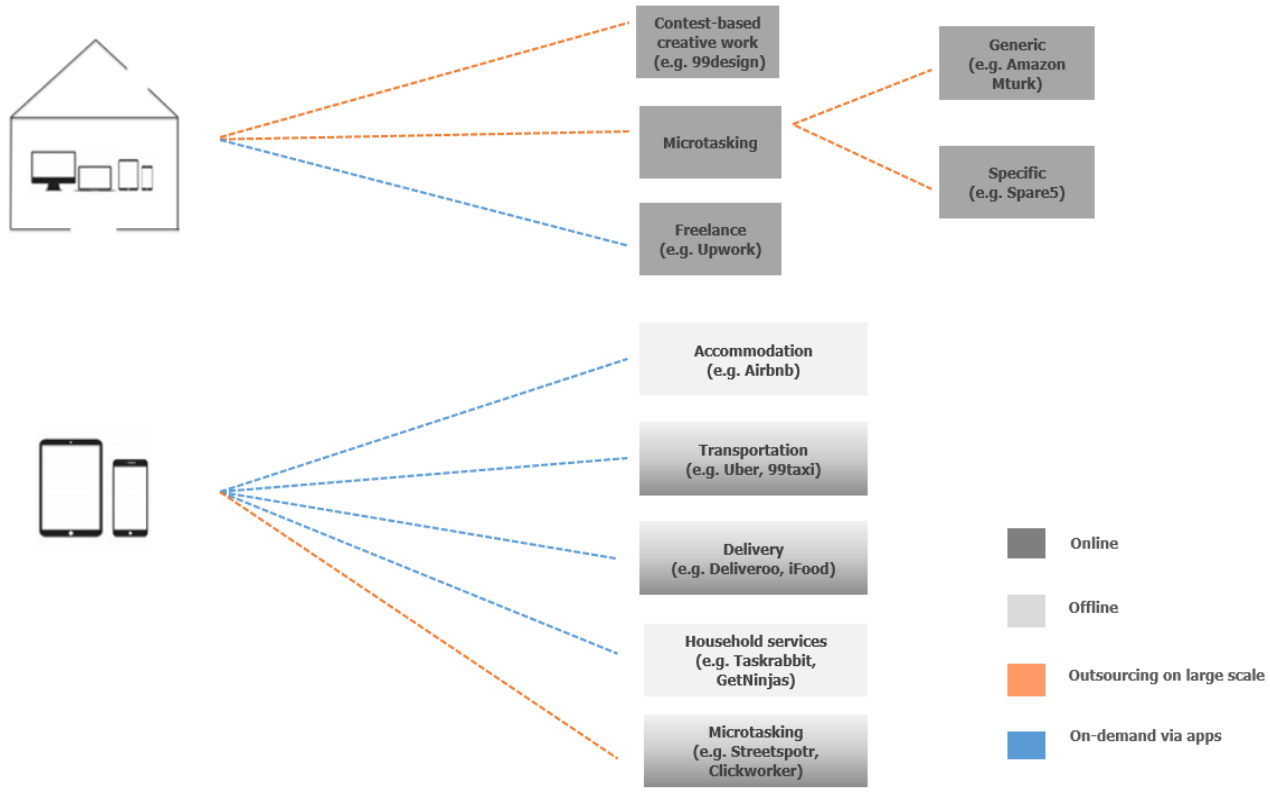
In those first reports and studies, microtasks were often mistaken for contest-based creative work and, above all, mistaken for freelancing, a main form of remote or online digital labor.

[5] In the tradition of scientific disputes, this debate has been generating endless arguments for or against different hypotheses on how surplus value is extracted from sociodigital platforms. For detailed reviews on the subject, see three excellent critical sources: Huws (2014), Marques (2017), Dantas and Raulino (2020).

However, freelancing concerns activities like graphic design and software development, when skilled workers are usually assigned entire projects from medium to long term. On the other hand, microtasks offer fragmented projects for short term, not demanding, in general, much qualification. Besides, freelance assignments occur individually, to an identifiable worker, instead of an anonymous crowd of workers, who are easily replaceable by the platforms (Tubaro, Casilli, Coville, 2020).

These three forms of remote digital labor differ from on-demand digital labor via apps, in which services such as transportation, delivery, accommodation and home service are carried out individually and in person or offline, even if they are managed via platforms. However, worth noting that certain microtasks may also require the provider to be at a certain location, for instance, to snap goods in a physical store. (Schmidt, 2017: 7, Berg et al. 2018, p. 4).

Figure 2 – Microtasks in the digital labor typology



Source: Own elaboration.

This typology can be useful to estimate the size and growth of the global digital labor market and its relation with "gig" or "platform economy" (Kässi; Lehdonvirta, 2018). In order to understand how microtasks affect the production chain of the new AI industry, we need to distinguish this particular form of digital labor from other remote and face-to-face forms that meet different economic and social demands, not related to the global market for AI data training (Tubaro; Casilli; Coville, 2020, p. 3).

5. Final considerations

Microtask platforms were born out of AI failures and limitations, designed to serve companies like Google, Amazon, Facebook, Netflix, Twitter, Uber, Apple, Microsoft and International

Business Machines (IBM). Many others are also looking to expand their business models by privately appropriating vast amounts of public data, accumulated globally over the last two decades of "Web 2.0". Far from a jack-of-all-trades, statistical algorithms such as machine or deep learning are still unable to detect the nuances of image, audio and text extracted daily from our social interactions, increasingly mediated by cybernetic communication and information technologies.

Assessing this data still requires a "crowd" of cybertaskers, rather than sophisticated algorithms. Ironically, AI today has little connection with its original ambitions proposed by Alan Turing in the 1950s: develop fully automated systems to solve problems that only humans are capable of, simulating the intellectual or cognitive faculty. Instead, the new AI industry tends to reorganize these problems in order for them to be solved both by learning machines and multitasking humans. Delivery workers, glued to their smartphones, travel by rented cars, motorcycles, bicycles or even electric scooters through the world's streets. Cybertaskers, in turn, glued to their computers, get by moonlighting intellectual odd jobs in makeshift home offices, away from our field of view. Despite the differences between both forms, it is worth noting that digital labor may express not only the real subsumption of "manual" but also of "intellectual" work, either in the center or in periphery of capitalism.

The obstacles that AI encounters in its marathon towards total automation always generate some kind of deskilled and more or less temporary human labor, as it seems to be the case of the ultra taylorized work required today by the new AI industry. The finish line keeps moving forward as its own technical and scientific community dreams up new apps; no one can determine whether the last mile will ever be completed. As put Mary Gray and Siddharth Suri (2019: 189-191), "the paradox of automation's last mile" explains the need to generate more human labor when the aim is to replace it with machines.

As early as the 19th century, Marx observed this phenomenon when discussing the relation between machinery and profit in modern industry. However, in his "*Grundrisse*" (from German, meaning "Foundations"), the author of "The Capital" drew the conclusion that automation would not only come up against the dynamic limits of science and technology, but also against the limits of capitalist society itself, society he witnessed being forged at full speed – metaphorically and literally. As written in the unfinished manuscript that gave rise to his greatest work:

> [...] under the rule of capital, the application of machinery does not shorten labor; but rather prolongs it. What it abbreviates is necessary labor, not the labor necessary for the capitalist. Since fixed capital [(e.g. science and technology)] becomes devalued to the extent it is not used in production, its growth is linked with the tendency to make labor perpetual. (Marx, 1973: 743-744)

Once converted into a commodity, labor power, in other words, the human capacity to transform and/or dominate nature according to imagination, cannot be completely replaced by machines, because, otherwise, capitalism would cease to exist. The most unique commodity holds a form of use value which is also capable of creating exchange value. When buying it, the capitalist must extract as much value as possible. Therefore, human labor results from this civilizational transformation of nature into culture (Mumford, 1934; Elias, 1994; Ellul, 1954; Pinto, 2005; Zuboff, 1984). Human labor must be extended far beyond the socially necessary time to (re)produce one's own labor power, a commodity whose use value is the source of the worker's subsistence, but not the capitalist's, owner of the means of production.

Many miles have been covered by automation and capitalism since the second half of the 19th century, but Marx's insight about such contradictions still stands. Even after the latest feats of AI, neither labor nor capital have vanished from *mappa mundi* so far, and the conflict between

the two is continuously reshaped after cyclical crisis of overaccumulation and successive economic, political and cultural innovations. When subjected to scrutiny, the new AI industry soon reveals the techno-scientific, but also the political-economic limits of the ambitious Leibnizian project of simulating judgment through calculation. Considering the degradation of human labor by increasing management or proprietary control through the division between planning and execution activities (Braverman, 1998), is all this reinforcing alienation?

Under the global spread of microtask platforms, accelerated during the pandemic, precarious work in the new AI industry may become the norm if social protection regulations are not implemented. Although the post-Covid-19 scenario looks quite unfavorable worldwide, we must remember that every factory floor is a space of alienated labor and, at the same time, a space for overcoming it. New practices of solidarity and political organization have also emerged among workers on these platforms as well as others. There are numerous examples: Turkopticon website, launched in 2009, Dynamo's guidelines for academic "requesters" at Amazon MTurk, established in 2014, FairCrowdWork.org, launched in 2015, the delivery app workers' strike in Brazil in 2020 and the creation of the Google Alphabet workers' union in the United States in 2021. These initiatives already signal, in central and peripheral capitalism, a new wave of social struggles to be waged by the "cybertariat" (Huws, 2003) or the "infoproletariat" of services (Antunes, Braga, 2009): a new white collar proletariat in need of rising up against the digital servitude in the home office.

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Acknowledgments and funding

Much appreciation to Silvio Rhatto, Douglas Maciel and two anonymous reviewers from Eptic for their valuable feedback on earlier versions of this paper. I give major thanks to Monique Figueira for translating. This research was supported by a doctoral scholarship from the National Council for Scientific and Technological Development (CNPq) and grants from the Academic Excellence Program (Proex), Brazil.